

Day-Case Laparoscopic Nissen Fundoplication

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ABSTRACT

Introduction: For day-case laparoscopic surgery to be successful, patient selection is of the utmost importance. This study aimed to assess the feasibility of day-case laparoscopic Nissen fundoplication and to identify factors that may lead to readmission and overstay.

Methods: A retrospective review of all patients who underwent day-case laparoscopic Nissen fundoplication over a 4-year period (2006 through 2010) was undertaken. Patient age, social circumstances, and other demographics were recorded as well as any comorbidities and ASA score. The primary endpoint measured was rate of readmission and overstay.

Results: A total of 72 patients fulfilled the inclusion criteria for day-case surgery. Five patients (6.94%) required admission immediately following the procedure, ie, overstay or were readmitted. The rates were 1.38% ($P=.05$, CI 95%) for readmission and 5.55% ($P=.05$, CI 95%) for overstay. Six (8.33%) patients were classified as ASA III, and 3 (50%) were readmitted or overstayed.

Conclusion: Day-case laparoscopic Nissen fundoplication is a feasible, safe option. The authors conclude that ASA score of III and increasing age correlate with an increasing incidence of overstay and readmission. Therefore, we would recommend the use of integrated pathways and advanced planning to reduce these rates.

Key Words: Nissen fundoplication, ASA, ASA score, Laparoscopy, Surgery.

INTRODUCTION

One of the fundamental aims of surgery is to return post-operative patients to their home environment in a safe, timely fashion. Day surgery is the admission of select patients to hospital for a planned surgical procedure after which they return home the same day.¹ The economic slowdown has had a major affect on healthcare, and budgetary constraints have been implemented internationally. Pressure from government bodies and insurance companies to attain an economic utilization of medical resources is forcing us to scrutinize the cost effectiveness of the services we are providing. Coupled with the fact that the patient population is aging, there is an urgency to reduce costs and continue to provide high-quality service to our patients. The transition of inpatient surgery towards day-case or ambulatory surgery is seen as an effective strategy to reduce costs. Day-case laparoscopic cholecystectomy has been shown to be safe in healthy patients with symptomatic gallstones and in those with minimal systemic disease, living within close proximity to the hospital.² There is also evidence that laparoscopic inguinal hernia repair can be performed safely as a day-case procedure.³ Since the advent of day surgery, the definition of an “acceptable” day surgery patient has changed, and strictly held criteria for suitability have been relaxed. The question has now become, “is there any reason why this patient should not be treated as a day case?”⁴ but for day-case laparoscopic surgery to be successful, patient selection is of the utmost importance. Factors that lead to overstay and readmission need to be identified at an early stage for day surgical units to be successful. This study aims to assess the feasibility of day-case laparoscopic Nissen fundoplication and to identify factors that may lead to readmission and overstay. Readmission is defined as admission of a patient to the hospital due to a postoperative complication following discharge after day-case surgery, while overstay is defined as a patient having to stay longer than the planned duration in the hospital.

METHODS

This study was performed on a cohort of 72 patients who underwent day-case laparoscopic Nissen fundoplication over 4 years (2006 to 2010). Surgery was performed after

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the patients were assessed, according to set protocols in a fully functional self-contained dedicated day ward that was introduced in 2005 in our institution. As a result, nursing, anesthetic, and surgical assessment on the day of admission was rapid.

Patients were seen in the outpatient clinic, and after making a decision about surgery, they were consented for the procedure by the team. Following this, patients were sent directly for preassessment at which time the suitability of the patient for day surgery was assessed. In the preassessment clinics, each patient was asked to fill out a standardized patient questionnaire to screen for medical and social problems. This questionnaire was aimed at highlighting factors that increase the risk of major anesthetic and operative complications, and concentrated on medical comorbidities, including obesity, and social circumstances. American Society of Anesthesiologists (ASA) classification was relied on to quantify patients' anesthetic risk. Class I, II, and III patients were deemed to be suitable for day-case surgery. There were no absolute upper limits on age or body mass index (BMI) for safe delivery of anesthesia on a day-case basis, although each patient was judged on an individual basis. An anesthetic consultant or registrar was available to deal with any queries. Social factors rarely had an impact on the decision to provide this procedure as a day case. Patient information leaflets were provided, which contained both general day surgery information and information specific to the proposed operation.

On arrival at the day unit on the prearranged day of operation, all documentation was completed and available. Any change of circumstance, either social or medical, was noted from the time of preassessment, and the preoperative surgical team visit was brief, because the main task was to verify consent and answer any questions the patient may have had. Surgery was completed with the patient under general anesthesia. Analgesia was delivered using 100-mg diclofenac sodium per rectum as a pre-emptive medication given 1 hour before induction of anesthesia, which was augmented by fentanyl (10 to 20mcg/kg) at induction (unless contraindicated). A single consultant led team, trained in laparoscopic fundoplication, performed procedures. Postoperative assessment of pain was performed using VAS (Visual Analogue Scoring System). Patients were discharged when standard discharge criteria (**Table 1**) were fulfilled. These criteria included hemodynamic stability, postoperative voiding of urine, adequate pain control, control of postoperative nausea or vomiting, and the ability to mobilize safely. Before returning home, patients were seen by the surgeon and anesthesiologist involved in their care. All day-case patients were required to

Table 1.
Discharge Criteria

Hemodynamic stability: vital signs stable for >1 hour
Adequate pain control
Adequate control of nausea and vomiting
Wound-minimal discharge
Passed urine
Tolerated oral fluids
Orientated to person, place, and time
Ability to mobilize safely
Understands use of postoperative analgesia
Written information on use of analgesia and wound care received
Dietary advice given
Caregiver available to accompany home and care for patient overnight
Follow-up organized
Emergency contacts provided

have a responsible adult to facilitate postoperative recovery at home. Standard advice received by all patients included wound care and the use of analgesia. They were further advised to contact the hospital or their general practitioner if they had any concerns.

Patient age, social circumstances, and other demographics were recorded, as well as any comorbidities and American Society of Anesthesiologists (ASA) score. Reasons documented for overstay and readmission were recorded as were durations of overstay and readmission. The primary endpoint measured was rate of readmission and overstay.

RESULTS

Initially 86 patients were identified from the laparoscopic Nissen fundoplication database maintained in our institution. Fourteen (16.27%) patients were excluded, because they were converted to open, or deemed unsuitable for day-case surgery at preassessment (**Figure 1**). Over the 4-year study period, 72 (83.72%) patients underwent day-case laparoscopic fundoplication. Results were generated by using SPSS v16.0. P<.05 was taken to be significant. This was calculated by using the x² test for frequency/ normally distributed data.

A total of 72 patients fulfilled the inclusion criteria for day-case surgery. These were patients >16 and <70 years of age, ASA I- ASA III, who were deemed fit for elective day-case primary laparoscopic Nissen fundoplication.

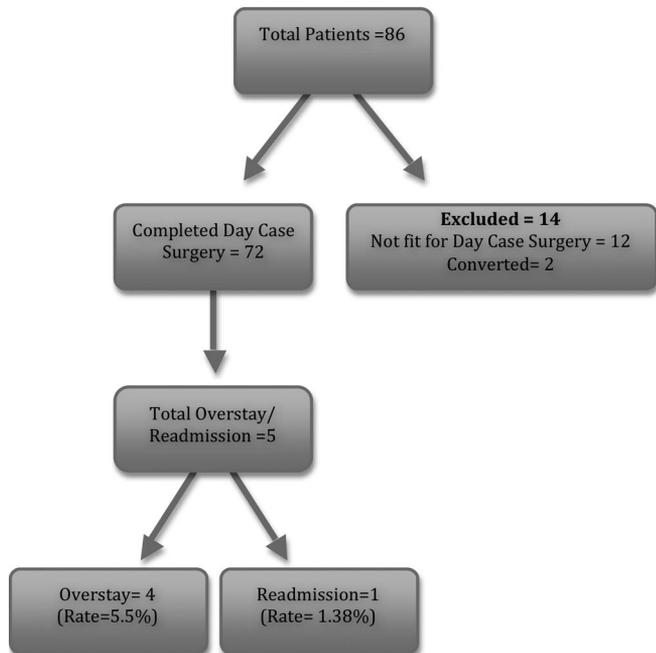


Figure 1. Data analysis overview.

The results show that the patients included in this study were between the ages of 20 and 63 years. According to ASA scoring they were graded between ASA I and ASA III with the maximum number of patients classified as ASA II (n=39, 54.16%).

Only 5 patients (6.94%) following the procedure required admission to the hospital immediately or were readmitted within 30 days. The rates were 1.38% (n=1) (P=.05, CI 95%), for readmission and 5.55% (n=4) (P=.05, CI 95%) for overstay. The maximum length of stay for any patient was 4 days. Postoperative pain (n=2), urinary retention (n=1), and technically difficult dissection (n=1) were the major causes for overstay. Persistent vomiting (n=1) in a young woman with a background history of psychiatric illness was the cause for readmission in the single case.

When considering the impact of ASA classification on readmission and overstay, we found that 4 patients who required admission following day-case laparoscopic surgery were classified as ASA II (1 patient) or ASA III (3 patients) preoperatively by an anesthetic registrar or consultant. Only 6 of 72 (8.33%) patients were classified as ASA III, and 50% (3/6) were readmitted or overstayed (**Figure 2**).

The maximum number of days spent in hospital as a result of readmission/overstay was 4 days. The impact of age on readmission and overstay is shown in **Figure 3** and shows

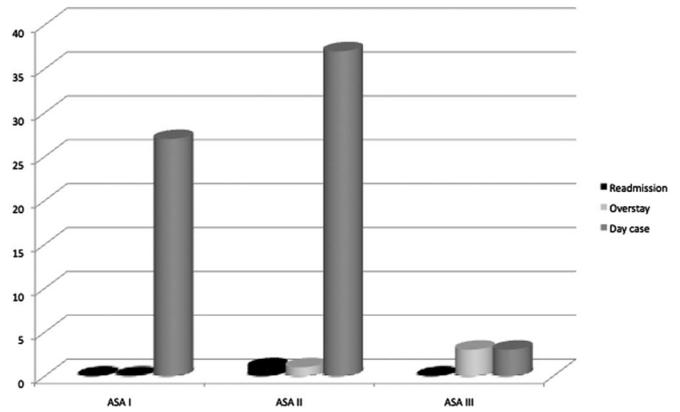


Figure 2. ASA vs readmission and overstay.

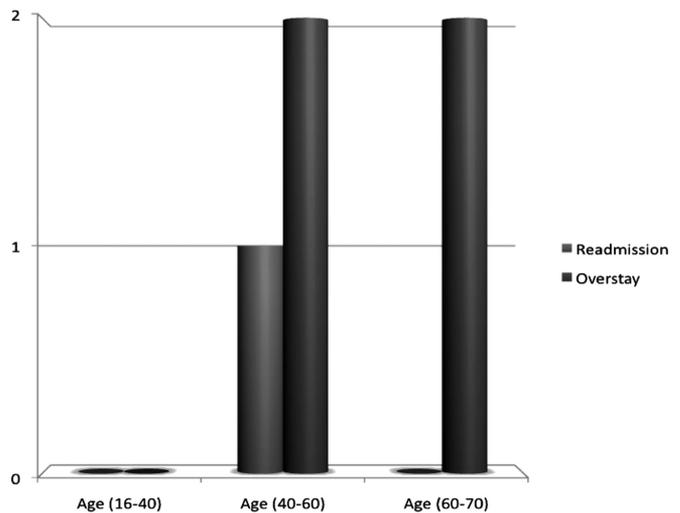


Figure 3. Age vs. readmission and overstay.

a higher rate of readmission and overstay in older patients. Men overstayed significantly longer than women did.

Our readmission rate was 1.38%, and our overstay rate was 5.5%, which is in line with Royal College of Surgeons England guidelines.

DISCUSSION

There has been a recent wave of enthusiasm amongst many general surgeons for laparoscopic surgical techniques to be utilized for a larger number of common surgical conditions following the success of cholecystectomy performed laparoscopically. The reported advantages of the laparoscopic approach over the conventional open method include reduced postoperative pain,⁵ shorter hospital stay, and rapid return to full activity with minimal discomfort. The conduct of surgical procedures on a day-stay basis has occurred for some time, and the

approach has accelerated in the past few decades. Day surgery now comprises over 70% of all elective surgery in the United Kingdom, over 80% in the United States, and is likely to become the default method of treating most surgical patients in the next 2 decades.⁶ Therefore, more needs to be done to establish safe, efficient day-surgery units so that ambulatory surgery can be exploited to its full potential.

There are many potential benefits to providing surgical procedures as a day case and these include:

- Patients receive treatment that is suited to their needs and allows them to recover in their own home;
- Cancellation of surgery due to emergency pressures is unlikely in a dedicated day-case unit;
- risk of hospital-acquired infection is reduced;
- Inpatient beds are released for major surgical cases;
- Junior clinicians may be released if there is an effective, nurse-led preassessment service overseen by a clinical lead (ideally, an anesthetist);
- Reduced waiting lists.

A multitude of studies have shown that certain surgical procedures, such as inguinal hernia repair, SFJ ligation, varicose vein surgery, and laparoscopic cholecystectomy can be delivered safely on a day case basis.³ However, for day-case surgery to be successful and cost effective, the Royal College of Surgeons in England recommends a readmission rate not to exceed 2% to 3% for any surgical day case.⁷ Therefore, preassessment and identification of patient factors that may lead to overstay and readmission is an essential and fundamental component of providing day-case surgery. This process starts at the time of surgical consultation, where a decision is made for the surgical procedure to be undertaken, and it is the responsibility of the surgeon assessing the patient to highlight any potential problems at this stage. The preassessment clinic follows on from this and should be run by suitably trained nursing staff, with leadership provided by a clinical lead usually from the anesthesia department, because they must develop guidelines for patient screening that are accepted by their anesthesia colleagues.⁷ Availability of appropriate investigations as well as a system for dealing with problem identified by the nursing staff must be in place to ensure that problems are highlighted and dealt with quickly and efficiently. Preoperative assessment also provides an opportunity to educate patients and their caregivers regarding the procedure they will be undertaking and the expected postoperative course.

Identification of patient factors that lead to overstay and readmission can be difficult, and one cannot say that

day-case surgery is not suitable for a patient based on one variable alone such as age. One can suggest factors that may predispose a patient to overstay or to be readmitted so that practical recommendations can be developed. There are several studies that have looked at this area and have suggested general selection criteria for a specific procedure. An extensive, well-designed Cochrane meta-analysis² studied day-case laparoscopic cholecystectomy and suggested that normal healthy individuals or those with mild systemic disease, who lived in close proximity to the hospital, and had the availability of a responsible adult to take care of them after discharge were suitable for a day case. Patients who had previous upper abdominal surgeries, those suspected to have common bile duct stones, and presenting with acute cholecystitis were not deemed suitable. A retrospective study of 312 day-case “nasal procedures” over a 17-month period examined patient demographic factors including, age, sex and ethnicity, and their impact on readmission rates and overstay frequency and duration. The authors concluded that suitable candidates for day-case ENT surgery included healthy individuals between the ages of 20 and 60.⁹

In our study, we found that both increasing age and ASA classification of II or III were the 2 factors that predisposed a patient to increased risk of readmission or overstay. With regards to ASA classification, there was a correlation between increasing ASA grade and overstay rate. It was also shown that increasing age correlated with increasing rates of overstay and readmission. Reasons for overstay were postoperative nausea and vomiting, difficult dissection, and urinary retention. Due to increasing age and comorbidities, one would expect that urinary retention would be more common and this is confirmed.

One cannot discuss day-case surgery without commenting on anesthesia. It must be stressed that a consultant anesthetist with an interest in day-case anesthesia is of paramount importance. Good day-case anesthetic management is underpinned by fundamental principles including

- patient safety as the main priority (as for inpatient anaesthesia),
- optimal conditions for the surgeon,
- rapid patient recovery,
- good postoperative analgesia,
- minimal nausea and vomiting.

A well-delivered general anesthetic with good postoperative analgesia and a low incidence of postoperative nausea and vomiting (PONV) is essential to reduce the incidence of overstay due to anesthetic complications. Pain management during anesthesia is based on a concept of multimodal an-

analgesia, which is a combination of 2 or more analgesic agents or analgesic techniques to minimize side effects. A common strategy is to use an NSAID or short-acting opioid in combination with regional or local anesthesia. The administration of stronger opiates, such as morphine and pethidine, at this stage is to be avoided, because its longer-lasting effects may lead to unplanned overnight admission. Administration of analgesia in recovery and on the day ward before discharge should be given before “breakthrough” pain occurs and is based on the accurate measurement of pain by the patients themselves.⁶

Without social structure in place, even the healthiest patient undergoing surgery is not suitable for day-case surgery.³ Therefore organization of services into dedicated day units that are separate from acute/emergency surgical services and the use of integrated critical pathways is essential. This unit can be on a standalone site or can be integrated into an acute hospital as long as it is separate from the acute surgical services, because evidence shows that unplanned overnight admission rates dropped dramatically from 14% on an inpatient ward to 2.4% in a dedicated day unit.¹⁰ Ideally dedicated elective day case lists should be independent of inpatient surgery, but if this is not possible, day cases should be done first on the list to allow adequate time for postoperative monitoring and to allow adequate recovery time. The more major surgical procedures should also be performed earlier for the same reasons.¹¹

Finally there are, of course, limitations to our study. Due to the nature of our study (cohort study), we cannot claim that care was standardized, even though there was a standard treatment plan in operation at our institution during this period. Surgical technique and use of local anesthetic was the same for all patients, unless there was a contraindication, but the operator was not always the same, because our institution is a teaching hospital and trainees would be involved in performing this procedure under supervision. Because anesthesia was delivered by different consultant anesthetists and anesthetic trainees, this is another aspect of care that was not standardized. It is also possible that a patient could have been readmitted to another hospital postoperatively, thus our readmission rate could be greater than reported. It would be extremely difficult to assess this, but there were no reports of admissions to other hospitals when the patients were followed up in clinic. As with any other retrospective study, missing charts and data will have some impact on our figures, but this was minimal as documentation was generally complete.

CONCLUSION

Day-case laparoscopic Nissen fundoplication is a feasible and safe option. Meticulous preassessment by using set protocols and guidelines to identify risk factors for overstay and readmission is a fundamental component of delivery of ambulatory day surgery accompanied by excellent day-case anesthetic management. The authors conclude that ASA score of III and increasing age correlate with an increasing incidence of overstay and readmission. Therefore, we would recommend the use of integrated pathways and advanced planning to reduce these rates.

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